



# Elective Open Groin Hernia Mesh Repair in All Risk Patients - Do We Need Antibiotic Prophylaxis?

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## Abstract

**Background:** Open groin hernia repair with a prosthetic mesh is a very common surgical procedure performed worldwide. Although this is a clean surgery, the risk of surgical site infection (SSI) is always there when prosthetic material is used. It is common practice to use antibiotic prophylaxis in such procedures. **Objective:** To find out if there is any need of antibiotic prophylaxis in cases of elective open groin hernia repair with prosthetic mesh irrespective of any risk. **Methods:** Medical record of 145 patients was reviewed retrospectively from January 2017 to January 2019. The information of age, gender, weight, presence of Diabetes mellitus, type of hernia, duration of stay in the hospital, and SSI and its types was recorded in a questionnaire. This data was analyzed to find the correlation between the risk factor and the SSI. **Results:** SSI was found in 2.8%(n=4) patients (superficial = 3, deep = 1). The mean age of the patients was  $48.12 \pm 17.27$ . All the patients were male. 2 patients were diabetic who did not develop SSI. 2.1% (n=3) patients had recurrent inguinal hernia and none of them developed SSI after surgery. The age, gender, weight, Diabetes mellitus, type of hernia, and postoperative stay in the hospital had no significant correlation with the development of SSI. **Conclusion:** There is no need to administer antibiotic prophylaxis in elective open groin hernia repair with prosthetic mesh in any patient irrespective of the risk.

**Keywords:** *groin hernia, mesh hernioplasty, antibiotic prophylaxis*

## Introduction

Hernia is the most common surgical problem encountered by general surgeons worldwide <sup>[1]</sup>. 70-80% of these hernias belong to the groin <sup>[2]</sup>. Most of these cases need an elective surgical repair to overcome the symptoms and to avoid complications (obstruction, strangulation). Many of these hernias recur after tissue repair <sup>[3-5]</sup>. Tension-free repair with prosthetic mesh has become very popular even in developing countries because of the very low recurrence reported <sup>[6]</sup>.

Hernia surgery is classified as of clean variety with a very low incidence of Surgical Site Infection (SSI) obviating the need of antibiotic prophylaxis <sup>[7]</sup>. The overwhelming use of prosthetic mesh in groin hernia repair has raised concerns regarding the rate of SSI and hence the need of antibiotic prophylaxis <sup>[8,9]</sup>. Many studies from all over the world have recommended the use of prophylactic antibiotics while using prosthetic mesh to reduce the incidence of SSI <sup>[10-13]</sup>. Many surgeons use topical antibiotics sprinkled over the mesh along with systemic antibiotics while others use only systemic regimens <sup>[14]</sup>.

Though many studies, most from developed countries show low incidence of SSI without antibiotic prophylaxis <sup>[15-17]</sup>, the subject remains controversial. Recent Cochrane systematic review recommends neither in favour of nor against the use of antibiotics <sup>[18]</sup>. International guidelines for the management of groin hernia by The Hernia Surge Group, The Netherlands recommend in favour of antibiotic prophylaxis in the high-risk environment (>5% incidence of SSI without antibiotics) and against its use in low-risk environments (<5% incidence of SSI without antibiotics) <sup>[19]</sup>. National literature shows many studies recommending the prophylactic use of antibiotics <sup>10,20</sup> while very few are against the use of antibiotics <sup>[21,22]</sup>.

The judicious use of antibiotics can save a huge cost <sup>[23]</sup> and can avoid their deleterious effects. Moreover, the misuse and overuse of antibiotics promote the emergence of antibiotic resistance <sup>[24]</sup>.

We aim to evaluate the need of prophylactic antibiotics in elective open groin hernia repair with prosthetic mesh, irrespective of the patient risk, in our setup.

## Materials and Methods

This cross-sectional retrospective medical record review was performed at the Department of General Surgery, Recep Tayyip Erdogan Hospital, Muzaffar Garh (managed by The Indus Health Network), a free-of-cost, tertiary care facility. After approval from the institutional review board, the computerized medical records of all the patients (male, female, any age) presenting with any type of groin hernia and undergoing elective mesh repair without antibiotic prophylaxis from January 2017 to January 2019 were included in the study. All the patients who underwent emergency surgery for strangulated hernia, those undergoing laparoscopic groin hernia repair, those receiving antibiotics for any reason within one week of the procedure, those who had any abdominal procedure in addition to the groin hernia repair, and those who had hernia repair without mesh were excluded from the study.

A questionnaire was filled for every patient in the study which contained the data of the age, gender, weight, presence of Diabetes mellitus, type of hernia, duration of stay in the hospital, and the presence of SSI and its types up to 30<sup>th</sup> postoperative day. SSI were classified according to the CDC guidelines.<sup>25</sup> The data were entered into the computer and analyzed by using the software IBM® SPSS® Statistics 20.0. Mean (SD) was computed for all the

quantitative variables like age, weight, and postoperative hospital stay in days. Frequency and percentage were computed for all the qualitative variables like gender, Diabetes mellitus, type of hernia, and SSI and its type during follow-up for 30 days postoperatively.

## Results

Elective groin hernia repair without prophylactic antibiotics was performed on a total of 145 patients (table). All the patients were male. The mean (SD) age of the patients was 48.12 ± 17.27 years (maximum 85 years, minimum 16 years, and the range 69 years). Mean (SD) duration of stay in the hospital was 1.05 days. 5.5% (n=8) patients stayed for 2 days, and 94% (n=137) patients stayed for 1 day. 2 of the 145 patients had Diabetes mellitus. 142 (97.9%) patients were operated on for primary inguinal hernia and 3 (2.1%) for recurrent inguinal hernia. During follow-up, SSI was found in 4 (2.8%) patients (superficial SSI = 3, deep SSI = 1), while 141 (97.2%) patients did not develop SSI during the follow-up. The age, gender, weight, presence of Diabetes mellitus, type of hernia, or postoperative stay in the hospital had no statistically significant association with the incidence of SSI in the postoperative period ( $p > 0.05$ ).

Table

Parameter	Details
Total Patients	145
Gender	Male (100%)
Age	Mean: 48.12 years ± 17.27 Range: 16–85 years
Hospital Stay Duration	Mean: 1.05 days Stayed 1 day: 137 (94%) Stayed 2 days: 8 (5.5%)
Diabetes Mellitus	2 patients (1.4%)
Type of Hernia	Primary: 142 (97.9%) Recurrent: 3 (2.1%)
Surgical Site Infections (SSI)	Total: 4 (2.8%) Superficial: 3 Deep: 1
No SSI During Follow-Up	141 (97.2%)
Statistical Significance	( $p > 0.05$ )

## Discussion

Inguinal hernia surgery is one of the most frequently performed procedures worldwide<sup>[1]</sup>. This study was conducted to find out if we can omit prophylactic antibiotics in the cases of elective hernia repair with prosthetic mesh. Misuse and overuse of prophylactic antibiotics have led to an increase in the cost<sup>[23]</sup> and antibiotic resistance<sup>[24]</sup>. We found that mesh hernioplasty has a very low incidence of SSI even without administering prophylactic antibiotics. This finding was consistent with the results of some RCTs conducted in the 2000s<sup>[15-17]</sup>. Therefore, the prescription of prophylactic antibiotics in elective groin hernioplasty is not necessary according to the results of our study.

Many studies have recommended Tension-free mesh repair as the procedure of choice for groin hernias<sup>[26-29]</sup>. SSI has been a bothersome complication of this surgery<sup>[21,22]</sup>. It may sometimes necessitate the removal of the prosthetic mesh to eradicate the infection<sup>[30,31]</sup>. Due to the fear of SSI after mesh hernioplasty, the use of prophylactic antibiotics has been suggested by many meta-analyses<sup>[32-36]</sup>. Therefore, it has become a common practice to give antibiotic prophylaxis in most regions of the world. On the other

hand, some other studies have found that antibiotic prophylaxis has no significant role in reducing the risk of SSI in such patients<sup>[15-17]</sup>. A Cochrane database systematic review has concluded that antibiotic prophylaxis should be given in high-risk settings while it is not needed in low-risk settings<sup>[37]</sup>. There is still a lot of controversy over this topic which needs to be addressed.

In our study, we performed tension-free mesh repair of 145 inguinal hernia patients. The rate of SSI is very low (2.8%) in our study population, and it was not causally related to any risk factors like age, weight, Diabetes mellitus, or duration of stay in the hospital. The rate of SSI has been found to be ranging from 3% to 5% in a systematic review<sup>[18]</sup>. Such a low rate of infection in a clean type of surgery<sup>[25]</sup> does not require the administration of prophylactic antibiotics. But these findings need to be verified by conducting large RCTs and meta-analyses on a mass scale to establish clear recommendations.

This study has few limitations. SSI has been reported to be increased by many risk factors which were not included in our study like smoking, immunosuppression, and chronic diseases like chronic obstructive pulmonary disease. Moreover, this is a retrospective data review which has its own limitations.

In conclusion, antibiotic prophylaxis is not needed in elective tension-free mesh repair irrespective of the risk. But large multicenter studies are needed to gather more evidence on this topic.

## Declarations

## Ethics approval and consent to participate

Its retrospective data, consent "Not applicable"

## List of abbreviations

No abbreviation used.

## Data Availability

DATA collected from the hospital registry and coded to conceal the identity

## Conflicts of Interest

There is no conflict of interest regarding the publication of this paper."

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## Authors' contributions

MIH wrote the manuscript, "Inamullah analyzed and interpreted the patient data All authors read and approved the final manuscript. "IS, KH, collected DATA. and ZA and NS reviewed articles. SMA corrected and supervise the whole manuscript

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